TEC modeling of disturbed and quiet period

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Total electron content (TEC) modeling of the equatorial ionization anomaly (EIA) during the recent 2015 St. Patrick's Day super geomagnetic storm have been carried out using the SAMI2 model with measured EXB drift as input. Model clearly indicates a resurgence of the EIA associated with the super fountain effect in the evening hours during the main phase of the geomagnetic storm. Model also indicates a complete suppression of the daytime EIA during the storm recovery day due to the disturbance dynamo electric field and disturbed meridional neutral winds. Efforts have also been made to model the quiet period daytime TEC. An artificial neural network based scheme has been implemented to derive the daytime vertical EXB drift from ionosonde Doppler measurement over Tirunelveli. This neural network derived EXB drift has been utilized in the SAMI2 code to model electron density over the Indian region. Quiet period TEC from SAMI2 model shows a good correlation with the observed TEC. Prospects of continuous ionosonde Doppler measurements, its correction based on neural network approach and utilization for the low latitude TEC modeling over a wider geographical area (also incorporating the observations from established ground networks like GAGAN) will be also be discussed.